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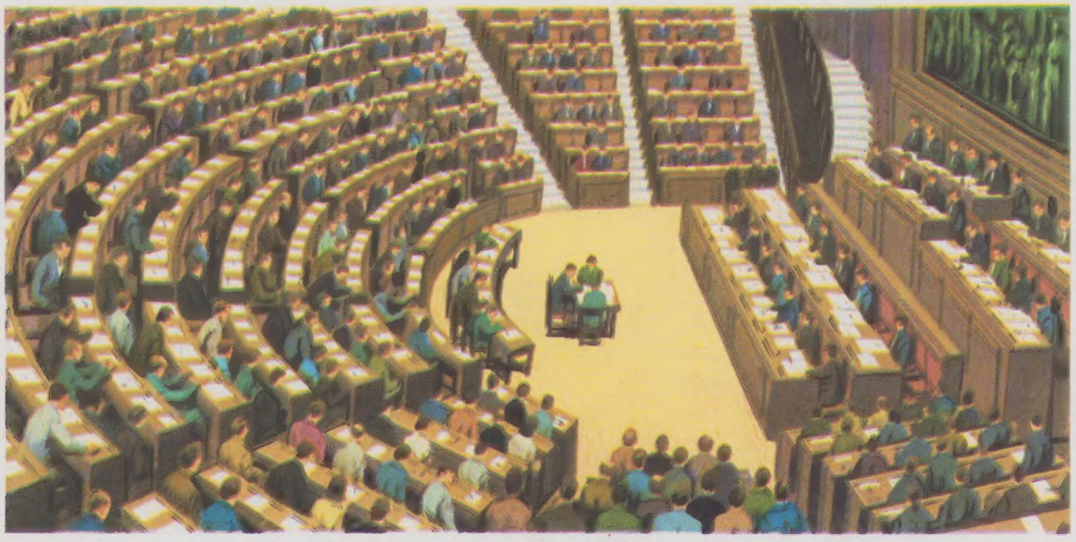
This issue contains the Index for Volume 15.

SECRETARIAL WORK (part two)



A personal secretary may go with her employer to important conferences

IMAGINE that you are working for a large firm. Suddenly you are summoned to an executive's office. His secretary is away – on holiday perhaps – and he urgently requires someone – you – to take her place. You are asked to telephone a dozen people and invite them to attend a meeting; you must then confirm the time and place of the meeting in writing to those who can come, and send each person an *agenda* (list of matters to be discussed at the meeting). Your employer thinks it may be necessary to have a break for lunch during the meeting, and asks you to book a table at a nearby restaurant. Finally, you must attend the meeting yourself and take a note of what is said.

Could you do all this? The answer is almost certainly 'No' – unless you have a knowledge of shorthand and typewriting. You could then take down your instructions in shorthand and type out the agendas, letters, and envelopes, making the required number of copies of each. You could also make a shorthand record of the meeting to be transcribed (translated) and typed out later. Your secretarial training (if you had had one) would also have taught you how to find out any information you might need, such as telephone numbers and addresses, how to prepare an agenda and phrase the letters, and how to use your head in such an emergency.

Of course, office life is not made up entirely of emergencies like this. There is a great deal of routine work to be done which is just as important and has to be dealt with just as efficiently. A good secretarial training will make this possible.

A comprehensive course

Secretaries are expected to do a great variety of tasks in the office. Therefore the secretarial training includes not only shorthand and typewriting but also such useful subjects as bookkeeping, English language, spelling, and grammar, and commerce or business practice. Anyone who has studied a foreign language at school can 'brush it up' and acquire a vocabulary of modern business terms that will come in useful if she works for a firm with branches or contacts overseas.

Because shorthand and typewriting are the two basic skills of a secretary, more time is devoted to them during the training than to any other subject. Emphasis is laid on accuracy as well as speed, and constant practice is given in taking dictation at varying speeds and in typing out letters and business reports. This not only helps to achieve high speeds but also teaches you the important knowledge of how such material should be laid out, or arranged on the page, to make it easy to read.

All the work done during the training is typical of that to be done in an office and gives the student a clear picture of how a business is run.

Modern machines

When she is at work a secretary may be called upon to use a duplicating machine, photographic copier, or dictating machine. Her training will have made her familiar not only with her typewriter but also with the many time-saving methods now available for producing copies of documents, singly or in vast quantities, for doing complicated calculations, or for recording messages, letters, or reports to be typed out later.

Courses

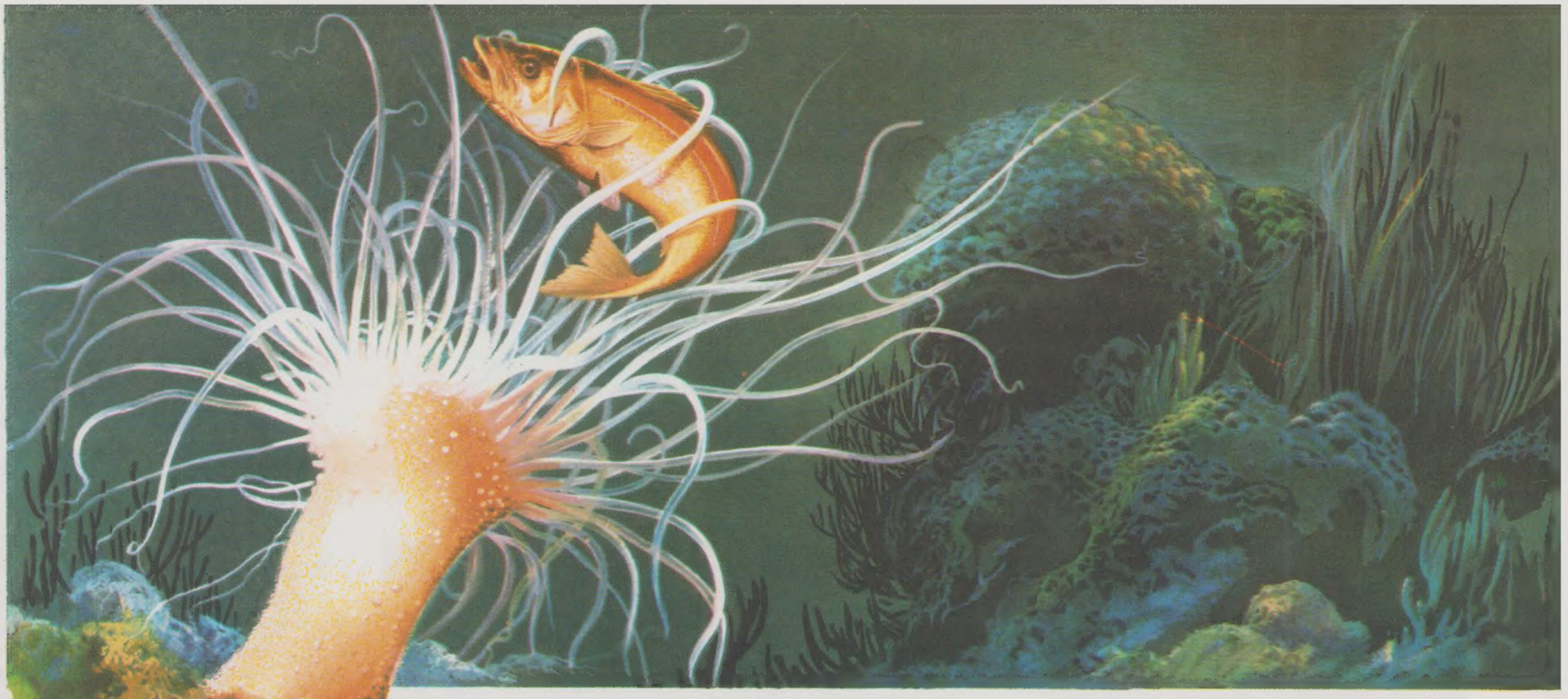
Because secretaries are needed in every office in every town, a secretarial training is offered by all local education authorities, in full- or part-time courses, or evening classes. There are also a great many independently-run secretarial colleges, some of which also provide a grounding in languages, domestic subjects, and economics.

The courses vary in length between 2 and 12 months, depending on the number of subjects studied and whether the students are full- or only part-time.

Examinations

At the end of the course the students can sit for the Royal Society of Arts examinations, which cover shorthand and typewriting at various speeds, and English, or for the London Chamber of Commerce Private Secretary's Diploma. These qualifications, together with a good standard of education, a pleasant personality, and a willingness to work hard, are the basic requirements for a good secretary.

Previous page: Symbols of the past (a statue), present (a flower), and future (a rocket), each with its own outline in Pitman's shorthand.



The hunter on the rocks: a sea anemone has captured a fish in its tentacles and is about to devour it

COELENTERATES

IN 1740 a Swiss naturalist, Abraham Trembley, was acting as tutor to the children of Count Bentinck in Holland. In his spare time he collected and observed living creatures, and one day he found some objects in a pond which he thought at first were tiny plants, because they were green and consisted of a stalk with a crown of thread-like 'petals'. But he noticed that when the bottle in which they were kept was jarred they contracted to little specks of jelly, later opening out again. This made him wonder whether they might perhaps be animals, and he decided to cut one in half and see if the two halves lived and regenerated. If they did, he thought, this would prove the organism to be a plant. They did live and regenerate, and the same thing happened when the creature was cut into smaller fragments.

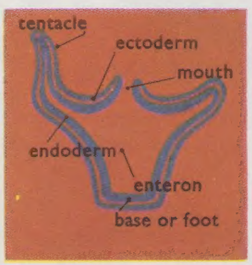
Before he had completed his experiments the French scientist Réaumur had pronounced this organism, which was then known as the 'fresh-water polyp', to be an animal. Trembley heard of this and made experiments on the movements and feeding habits of the polyp which led him to agree entirely with Réaumur. Here was an *animal* which could grow into a new individual from a 'cutting', as if it were a carnation or a poplar tree. Today we are used to the idea of animals regenerating, like star-fishes (see page 2747), but at that time the notion seemed fantastic, and the news made a tremendous stir. The great Réaumur reported the matter to the king of France, and relates in his memoirs that 'His Majesty appeared to be very pleased to hear about it'.

Trembley's little polyps, first described by the Dutch inventor of the microscope, van Leeuwenhoek, are now known by the name *Hydra*. They are typical members of the Phylum Coelenterata.

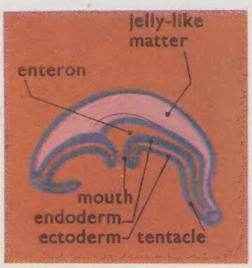
A little living tube

If thin sections of a hydra's body are cut and examined with a microscope, it is found to consist of a slender tube, closed at the base and with an opening surrounded by a ring of tentacles at the other end. The microscope shows that the walls of the tube consist of only two layers of cells which are called the *ectoderm* (outer skin) and the *endoderm* (inner skin). The tentacles are hollow and also formed of two layers. The inner cavity of the tube is the hydra's stomach (*enteron*) and the opening is its mouth, through which it also voids waste matter. It is a very simple animal.

Two forms. As we shall see, the coelenterates are very diverse in appearance, but there are two basic forms: the *polyp* and the *medusa*.



Diagrammatic section of a polyp (left) and of a medusa (right). Polyps are generally fixed at the base or foot with their mouths facing upwards; Hydra *is a polyp. A medusa or 'jelly-fish' floats in the water with its mouth downwards*



CLASSIFICATION

Phylum	Class	Subclass	Examples
Coelenterata or Cnidaria	Hydrozoa		*Hydra* in fresh water, *hydroids* or sea-firs and *Siphonophora* in the sea
	Scyphozoa		Jelly-fishes
	Anthozoa	Alcyonaria	Soft corals and sea-fans, polyps with eight-branched tentacles
		Zoantharia	Sea anemones and corals, polyps with numerous simple tentacles

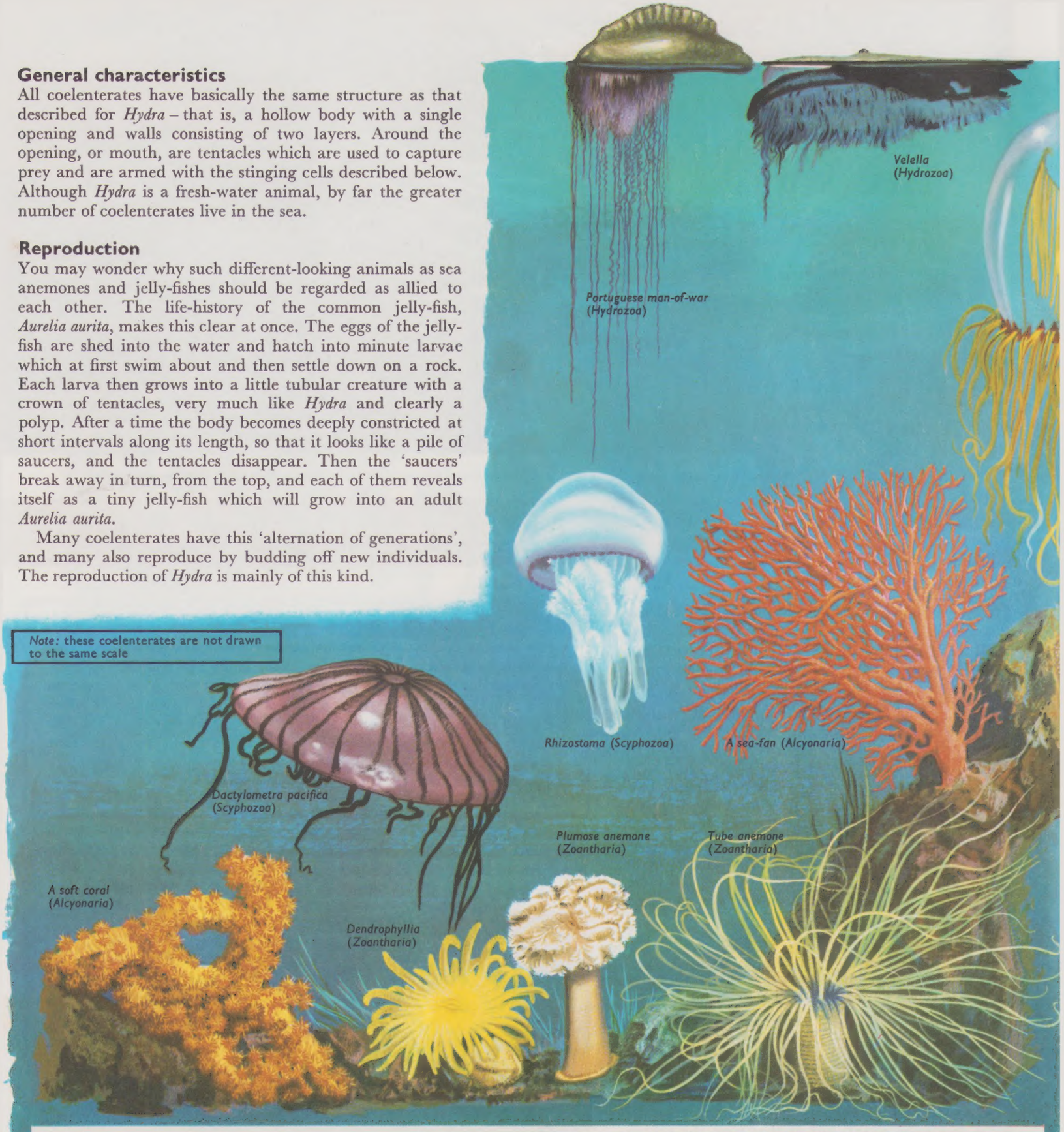
General characteristics

All coelenterates have basically the same structure as that described for *Hydra* – that is, a hollow body with a single opening and walls consisting of two layers. Around the opening, or mouth, are tentacles which are used to capture prey and are armed with the stinging cells described below. Although *Hydra* is a fresh-water animal, by far the greater number of coelenterates live in the sea.

Reproduction

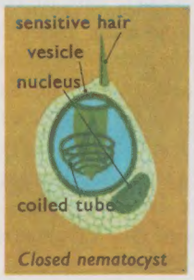
You may wonder why such different-looking animals as sea anemones and jelly-fishes should be regarded as allied to each other. The life-history of the common jelly-fish, *Aurelia aurita*, makes this clear at once. The eggs of the jelly-fish are shed into the water and hatch into minute larvae which at first swim about and then settle down on a rock. Each larva then grows into a little tubular creature with a crown of tentacles, very much like *Hydra* and clearly a polyp. After a time the body becomes deeply constricted at short intervals along its length, so that it looks like a pile of saucers, and the tentacles disappear. Then the 'saucers' break away in turn, from the top, and each of them reveals itself as a tiny jelly-fish which will grow into an adult *Aurelia aurita*.

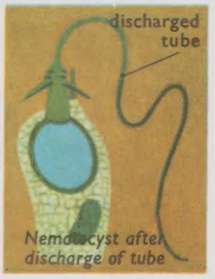
Many coelenterates have this 'alternation of generations', and many also reproduce by budding off new individuals. The reproduction of *Hydra* is mainly of this kind.

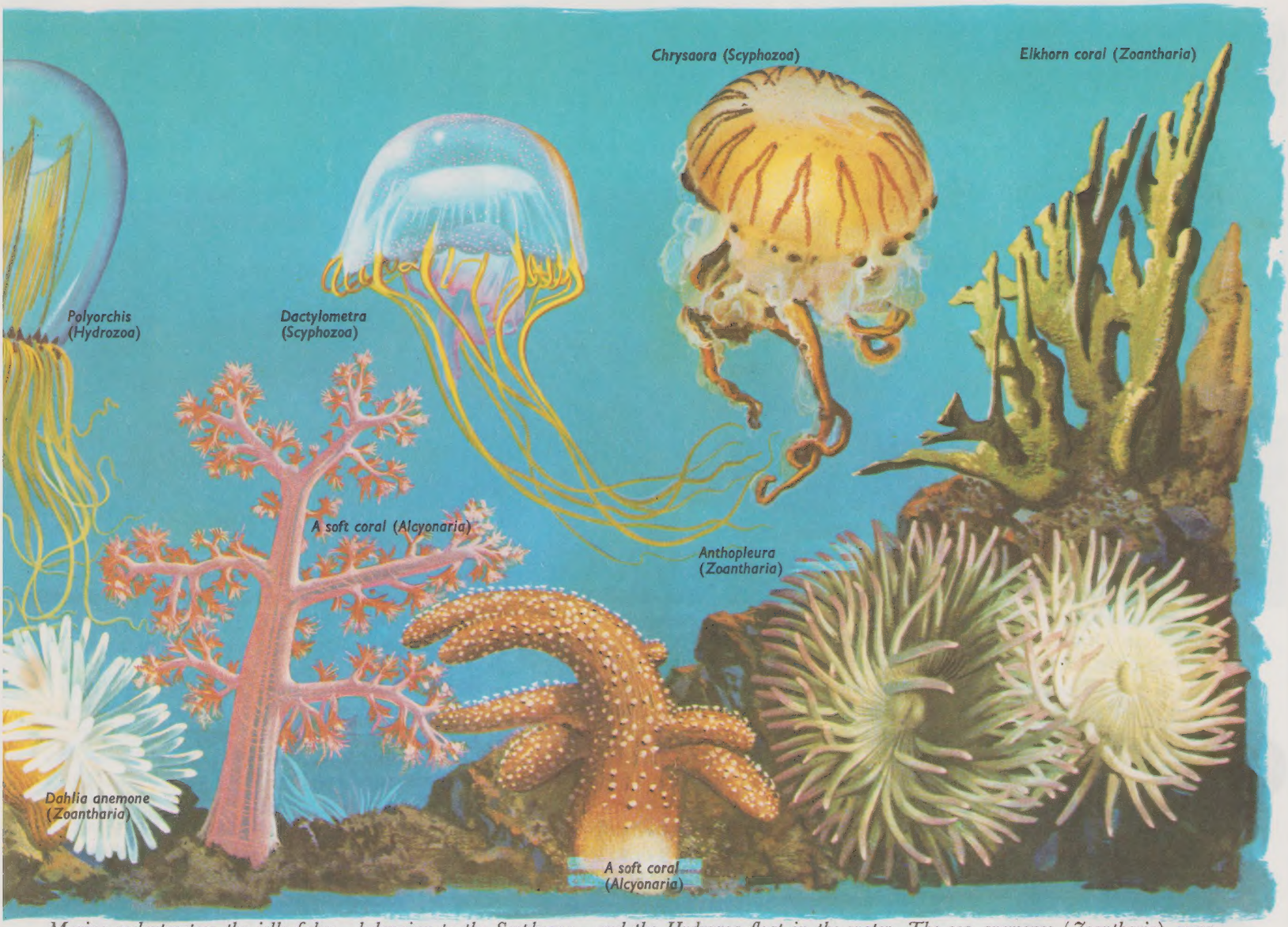


POISONED DARTS

The tentacles of most coelenterates have tiny stinging cells called *nematocysts*. Each of these consists of a capsule filled with poisonous fluid, pushed in at one point to form a slender, hollow tube which lies curled up inside the capsule. If the nematocyst is touched, the coiled-up tube is hurled out with great force, turning inside-out as it goes, just as a finger of a rubber glove can be pulled in towards the palm and then forced out by blowing into the glove's wrist. When a fish touches a tentacle thousands of these tubes flash out, pierce its skin, and break, and the poison from inside the nematocyst is injected. Some jelly-fishes can pierce the human skin and sting severely.







Marine coelenterates: the jelly-fishes – belonging to the Scyphozoa – and the Hydrozoa float in the water. The sea anemones (Zoantharia) grow attached to rocks. The stony corals also belong to the Zoantharia, while the soft corals are alcyonarians

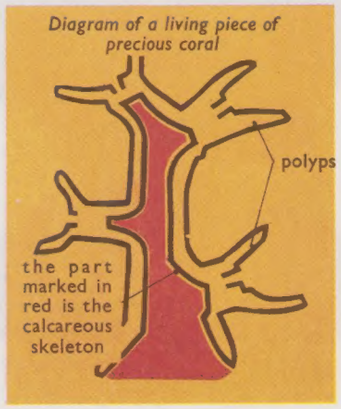
Three Classes

As you can see in the classification table on page 2881, the coelenterates are divided into three Classes.

Hydrozoa. *Hydra* belongs to this Class, but its most typical members are the hydroids or sea-firs. These consist of a branching system of tiny polyps, each enclosed in a horny cup, connected to each other by a horny tubular skeleton. Dead fragments of hydroids are very common on the shore and look like colourless pieces of finely branched fern. They grow attached to rocks, and many of them go through a medusa stage. The *Siphonophora* are hydrozoans which float in the water like jelly-fish. The best known of these is the Portuguese man-of-war which floats by means of a gas-filled bladder and has long, stinging tentacles hanging down from it. Its sting is very severe.

Scyphozoa. This class includes the true jelly-fishes, which are all medusae (though they may go through a polyp stage) and which float in the waters of the sea. A typical jelly-fish is like an inverted bowl; its mouth is in the middle of its undersurface and its tentacles hang down from the edge. The most common species in northern European waters is *Aurelia aurita*. Some jelly-fishes grow to a great size; the 'lion's mane' jelly-fish (*Cyanea capitata*) may reach 7½ feet in diameter and have tentacles 100 feet long. Some tropical scyphozoans sting severely or even dangerously.

Anthozoa. Sea anemones and corals make up this Class. Sea anemones are large, single polyps with many tentacles, often beautifully coloured and resembling flowers. They are found mostly in fairly cold waters and are common in rock-pools on the shore. Corals are more characteristic of tropical seas. They usually grow in masses, the polyps touching and merging into each other. Most of them secrete hard skeletons of calcium carbonate, and the skeletons of marine corals form coral reefs. The anthozoans fall into two Subclasses: the *Zoantharia*, which includes the reef-building corals and the sea anemones; and the *Alcyonaria*, soft corals and sea-fans. These have polyps with eight tentacles, and most of them do not have hard, stony skeletons. The exception to this is the precious red Mediterranean coral, which, though an alcyonarian, has such a skeleton.



HISTORY OF GERMANY (part two)

AS we saw on page 2870 mediaeval Germany was composed of large, almost independent blocks of territory like Franconia, Swabia, and Lorraine. Over these the kings of Germany had little power. In fact, authority in Germany was *decentralised*. The history of Germany is largely the story of these independent Germanic regions, each pursuing its own separate policy. Even individual towns were given semi-autonomous rights as 'Free' or 'Imperial' cities. Moreover, in the west the land became more and more subdivided so that literally hundreds of petty states, towns, and bishoprics had their own rulers. But in the east something rather different happened. The 12th and 13th centuries witnessed a remarkable migration of German people into Slav lands east of the Elbe, and northwards along the Baltic. Towns like Lübeck and others of the Hanseatic League (see page 2750) sprang up, and – even more important – large areas like Austria, Hungary, Bohemia, and Brandenburg came into the German circle. These did not split up, and so the most powerful Germanic rulers of the later Middle Ages tended to be the owners of these eastern territories. This is the key to the astonishing rise of the House of Habsburg. It was not because of the authority of the title 'king', or 'emperor', but because they ruled Austria, Bohemia, and Hungary that the Habsburgs came to dominate Germany.

We have already seen (page 2870) that the kings of Germany owed their position to election as well as heredity. This system was not formalised for a long time. Originally many of the German princes had a voice in the election, and often they would elect not a strong but a weak king. It was sometimes in their interests to do so, for a strong king might curb their own authority. By the middle of the 14th century, however, the election had become confined to the seven rulers of the so-called 'Electorates' (see page 2566).

Luther – he split Germany in two

Oddly enough, the very weakness of the monarchy and independence of the princes almost resulted in the erection of a powerful kingship. For the Habsburgs used their freedom to build up an astonishing power which at one point, as we shall see, looked like enabling them to crush the other princes and rule in Germany as completely as the kings in France and England.

Who were these Habsburgs? Their story begins in 1273 when the electors chose a member of the lesser nobility, **Rudolf, Count of Habsburg,** as emperor. Rudolf invested his sons with Austria, Styria, and Carniola, and married his children to the heirs presumptive of Bohemia, Naples, Provence, and Hungary. In doing so he began the extraordinary extension of the power of the House of Habsburg.

Charles V – immensely powerful

The Defenestration of Prague, 26th March 1618. Protestant

Rudolf's successors built up Habsburg power still further. The electors resented and feared them and chose emperors like **Lewis of Bavaria** and **Charles IV** of Luxembourg from other families. Charles (1346–1378) proved one of the greatest of mediaeval rulers. His Golden Bull of 1356 established the complete supremacy of the larger states, regulated the electoral system, and confirmed the position of the seven Electorates. The House of Luxembourg gained so much influence that it established itself as the Imperial family almost as if by hereditary right. In 1438 **Sigismund** of Luxembourg died without sons and left all his possessions – Bohemia, Moravia, Silesia, Hungary, and Luxembourg – to **Albert,** the Habsburg ruler of Austria. Rudolf's marriage policy had paid rich dividends. Albert was elected German emperor, and from then on the Habsburgs were almost sole holders of the title until its abolition in 1806.

HOLY ROMAN EMPIRE IN 1360

HOLY ROMAN EMPIRE IN 1494

HOLY ROMAN EMPIRE AFTER 1580

rebels seize two Imperial Catholic officials in Prague. The story goes that as they threw them out of the window they shouted: 'Now let their Mary save them! Seeing the two shaken but living figures rising from the ground, they exclaimed: 'By God, she has!'

The great Habsburg Emperor **Maximilian I** (1493–1519) added Burgundy to his already vast possessions. When the immensely powerful **Charles V** (1519–1556; see page 1530) became Emperor it seemed that nothing could prevent the Habsburgs from rewriting the German constitution, centralising authority, and overthrowing the independence of Bavaria, Saxony, Hesse, and the other states. Plans for reform along these lines were indeed publicised. Yet it should be remembered that the general desire to make a united nation out of Germany was so weak that Charles's two rivals in the Imperial election were the king of France and the king of England!

But it was the Reformation which wrecked the possibility of German unity. During the 1520s and 1530s Lutheranism split Germany in two. Some of the princes, like the rulers of Brandenburg and Saxony, eagerly accepted the new religion in order to dissociate themselves further from the emperor. Charles failed to conquer Protestantism, and the **Peace of Augsburg** (1555) confirmed German disunity. It laid down that the German princes could become Lutheran if they wished, and the religion of their territories should conform to their decision.

The Counter-Reformation halted the Protestant advance in Germany as elsewhere, and even reversed it in certain places. The emperors **Ferdinand** (1556–1564), **Maximilian II** (1564–1576), **Rudolf** (1576–1612), and **Matthias** (1612–1619) won the firm support of the Catholic parts of the empire. Then an event occurred which plunged Germany into worse chaos than it had ever known. In 1618 a Protestant revolt broke out in Bohemia. Two Habsburg officials in Prague were thrown out of a window by Protestants who promptly proclaimed their independence from the emperor. This revolt developed into the **Thirty Years War.** For thirty years foreign troops, hired mercenaries, and German armies tramped across the country, laying it waste and wrecking its economy. **The Peace of Westphalia** (1648) marked the defeat of the emperor. Henceforth the individual German states could conduct their own policies without even nominal reference to the emperor. Germanic states were even free to make foreign alliances against him.

During the Thirty Years War most of Germany decayed, but one ruler in particular managed to increase his power and enlarge his territory. **Frederick William,** the 'Great Elector' of Brandenburg (1640–1688), using brilliant, if ruthless, diplomacy, began a programme of expansion continued by his successors.

Meanwhile, despite the disasters of the Thirty Years War, the Habsburgs had consolidated their power in the great Austrian empire, and even extended it into large areas of Italy. Thus what is known as the 'era of dualism' began, with a clash between Austria and Prussia for the leadership of Germany becoming ever more likely.

The first clash came with the accession of **Frederick the Great** (1740–1786) to the Prussian throne. He seized Silesia from **Maria Theresa** (see page 1680) in the Austrian War of Succession (1740–1748), and fought again in the **Seven Years War** (1756–1763). In 1772 he annexed the invaluable West Prussia from Poland.

The Austro-Prussian conflict was not resolved in the 18th century. It lasted until Austria's complete defeat in 1866 and her exclusion from the German empire created by **Bismarck** (see page 1332) in 1871.

HOLY ROMAN EMPIRE IN 1660

HOLY ROMAN EMPIRE IN 1789

THE ORKNEYS AND SHETLANDS

Bleak Shetland scenery; salt spray stunts the growth of trees

AMONG the loveliest of all Britain's islands are the Orkneys and Shetlands which lie north-east of Scotland. Most of them are uninhabited, and several are bird sanctuaries. Many of the people are crofters, with their own smallholdings, and on a few islands the small, shaggy Shetland ponies are still bred. But the population of these islands is steadily decreasing; those who want modern comforts and high wages find them more easily on the mainland of Scotland. One day, perhaps, the seabirds will have the islands to themselves.

The Orkneys and Shetlands have been classed together for a very long time. They were first inhabited by the Picts, and in the 9th century A D were annexed by Harold Fairhair, the first King of Norway. For nearly 600 years after this they were ruled by the Norwegians, but in 1468 King Christian of Norway and Denmark pledged the islands as security against a dowry payment for his daughter Margaret, who married the Scottish king. Christian did not redeem the pledge, and in 1472 the islands passed to Scotland.

The Orkneys

The Orkneys are separated from the mainland of Scotland by the Pentland Firth. Geographically they are linked to the Plain of Caithness, and as a result the islands are quite low. Despite this, cliffs rise sharply from the sea. Altogether there are about 90 islands in the archipelago, which is about 50 miles long and 35 miles wide. Only about 20 are inhabited, and the population is dropping steadily. In 1861 it was 32,395; in 1951 21,258; and in 1962 it was estimated at 18,531. The most important islands are Pomona or Mainland, South Ronaldsay, Westray, Sanday, and Stronsay.

The climate of the Orkneys is pleasant, with an average annual temperature of 45°F and the comparatively low annual rainfall of 31 inches, much of which falls as drizzle. In summer the long days remind us how far north the islands are.

Pomona, the largest island, has an area of 189 square miles, including a few tiny islands close to it. Its main town is Kirkwall, a port and herring-fishing centre, which was created a royal borough by James III in 1486. Nearby is an airport which connects the Orkneys to the mainland. The only other town in the islands is Stromness, also on Pomona.

The Orkneys are traditionally agricultural. Crops including oats and roots are grown; and sheep, cattle, and poultry are reared. The most important export is eggs, and other exports include agricultural produce, salt fish, and whisky.

Many Pictish remains are found in the islands, including burial mounds, circles, standing stones, and underground dwellings. At Skara Brae, a Stone Age village has been excavated.

The Shetlands

The Shetlands, or Zetland, lie some 60 miles to the north-east of the Orkneys. In structure and scenery they are like the Highlands, reaching their highest point in Ronas Hill (1,475 feet) on the north of Mainland, the largest island. The group is about 85 miles long by 45 miles wide, and only a few of its hundred-odd islands are inhabited. The Shetlands are so far north that in summer it is never really dark; they are almost as close to Bergen in Norway as they are to Aberdeen in Scotland.

Mainland has an area of 406 square miles – three-quarters of the islands' total. The only town in the Shetlands is Lerwick, a fishing port on the east coast of Mainland. The old capital, Scalloway, is now just a village, and its castle is ruined.

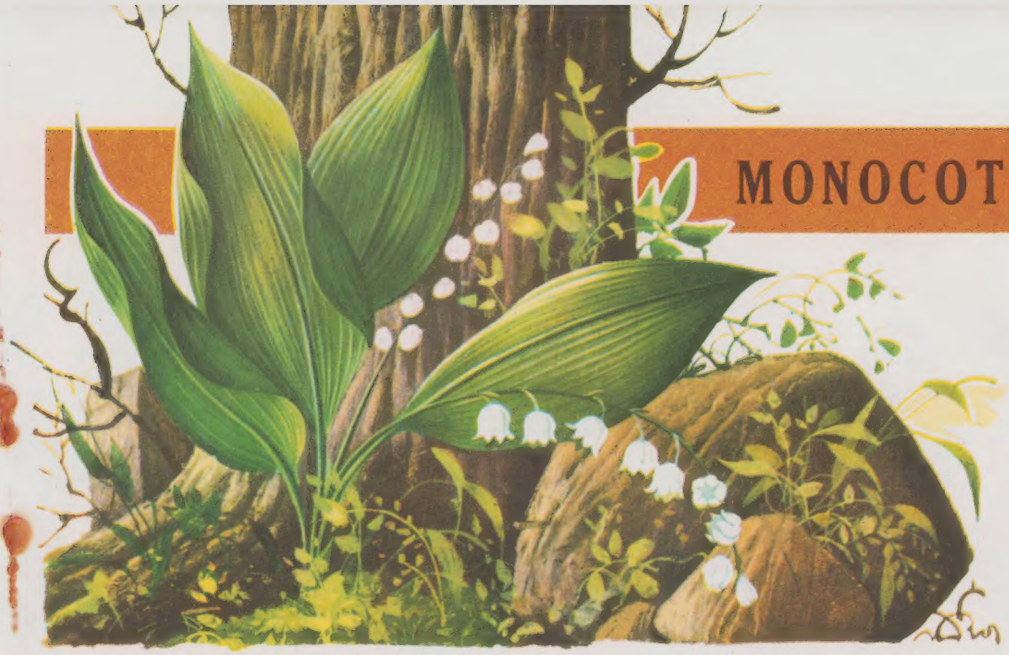
Only about one-sixth of the Shetlands is cultivated, and the main crops are oats, barley, roots, and hay. Sheep are still reared, although the traditional Shetland breed is now dying out. Wool from these sheep has led to the traditional industries of weaving and knitting, carried out at home by the crofters' wives. Fair Isle, which lies between the Shetlands and Orkneys, has become famous for the intricate and colourful patterns used by its knitters.

The population of the Shetlands, like that of the Orkneys, is declining. In 1861 it was 31,670; in 1951 19,343; and in 1962 about 17,540.

There are not many ancient remains in the Shetlands, though some of the round stone towers or *brochs* of the Picts can still be seen. The years of Norwegian rule, and their proximity to Norway, are shown in local customs and in words still used in the dialect. In the Second World War the Shetlands provided a welcome shelter to Norwegians. They also had the distinction in that war of being the first place in Britain to receive a German air raid – in November 1939.

DID YOU KNOW?
Among the Norse customs of the Shetlands is the festival of Up-Helly-Aa, on the last Tuesday in January. A procession carrying torches follows a dummy Viking ship through Lerwick to the shore, where it is burned.

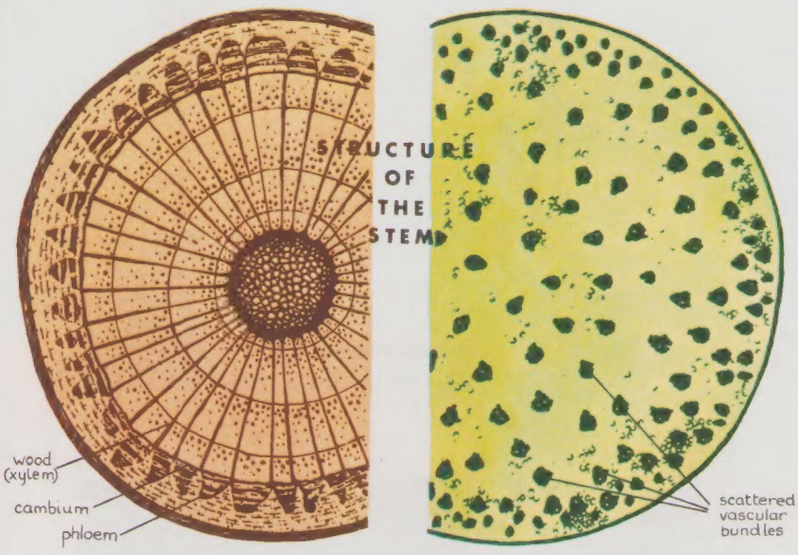
MONOCOTYLEDONOUS PLANTS



The lily-of-the-valley, an example of the Class of plants called Monocotyledoneae

MAIZE and pineapples, dates and daffodils – what have these in common? At first sight few things could seem more different, but in fact they all belong to the Monocotyledoneae, the great Class of plants which, with the Dicotyledoneae, makes up the Division Angiospermae, or flowering plants.

The names of these Classes are ponderous and clumsy, so botanists often abbreviate them to 'monocots' and 'dicots'. Cotyledons are the leaves which are already present in the embryo of a plant before the seed germinates. Sometimes these seed-leaves appear above ground after germination as the first green leaves; in other plants they act as food stores and never take the normal form of leaves at all. The two Classes have been given their names because in a dicotyledonous plant there are always two cotyledons and in a monocotyledonous plant there is always only one. The number of cotyledons is not, however, the only characteristic that distinguishes the two Classes.



Sections of the stem of a dicotyledonous woody plant (left) and of maize, a monocotyledonous plant (right)

On page 831 we have described how a layer of tissue called the *cambium* enables the stem of a woody plant to become thicker year after year. The cambium is a layer of cells which surrounds the wood like a sleeve, and is itself surrounded by the tissue called the *phloem*, outside which is the bark. The cells of the cambium are constantly dividing, forming new wood inside and new phloem outside. What we did not mention in this account of the functions of the stem is that only the dicotyledonous plants have this layer of constantly-dividing cambium cells. The monocotyledons do not have it, and their bundles of connecting tissue are not arranged in a ring round the stem but are scattered through it at random.

The illustration below shows some other differences between the two Classes: the roots of monocotyledons generally form a tuft and have no tap-root; their leaves are narrow, with parallel veins; the petals and other parts of their flowers are usually in multiples of three.

Economic uses of monocotyledons

The members of the grass Family (Gramineae) include wheat, rice, maize, and the various forage grasses which are the main food of cattle all over the world. They are the most important of all food-producing plants. The date and coconut palms both form the basis of important industries, the main use of coconuts being to produce vegetable oil. Other monocotyledonous fruits of importance are the banana and the pineapple. Some important fibre-producing plants, including sisal, New Zealand hemp, and Manila hemp (a kind of banana), belong to this Class. Leeks, onions, and asparagus are the only important monocotyledons in the vegetable garden, but many of the most beautiful cultivated flowers, including all the spring 'bulbs', lilies, irises, and orchids, are monocotyledons.

CHARACTERISTIC FEATURES OF MONOCOTYLEDONS

Tufted root of wheat

Leaf with parallel veins

Flower with six petals

CHARACTERISTIC FEATURES OF DICOTYLEDONS

Root with tap-root

Leaf with network of veins

Flower with five petals

ORDER LILIIFLORAE

Family: Liliaceae
Examples:
lilies
bluebell
tulip
onion
asparagus

Tiger lily

Family: Amaryllidaceae
Examples: daffodil
narcissus

Narcissus

Family: Iridaceae
Examples: iris
autumn crocus

A species of iris

ORDER SCITAMINEAE

Family: Musaceae
Example: banana

Banana plant with fruit

Family: Cannaceae
Example: *Canna indica*

The brilliant flower of Canna indica

ORDER GLUMIFLORAE

Family: Gramineae
Examples:
wheat
rice
barley
maize
reed
rye grass
cocksfoot grass
bamboo
sugar cane

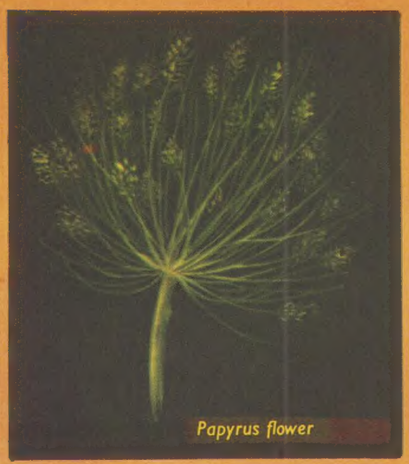
Panicle of rice

Ear of wheat

Stem and leaf of bamboo

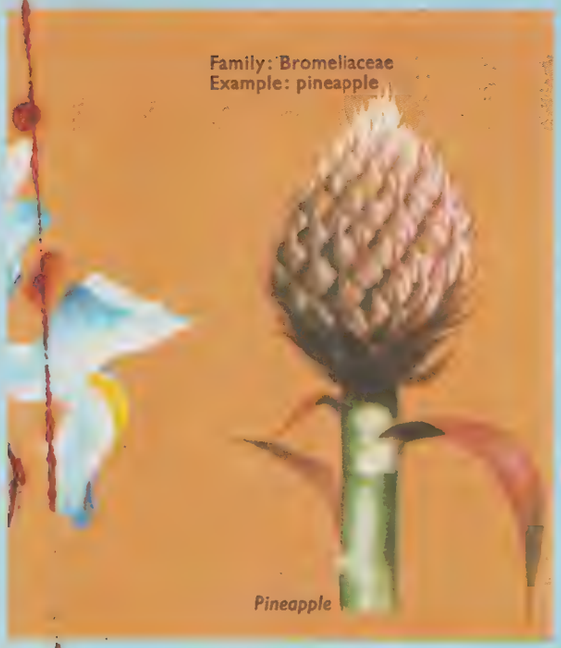
ORDER CYPERALAE

Family: Cyperaceae
Example: papyrus



Papyrus flower

Family: Bromeliaceae
Example: pineapple



Pineapple

ORDER MICROSPERMAE

Family: Orchidaceae

Cypripedium

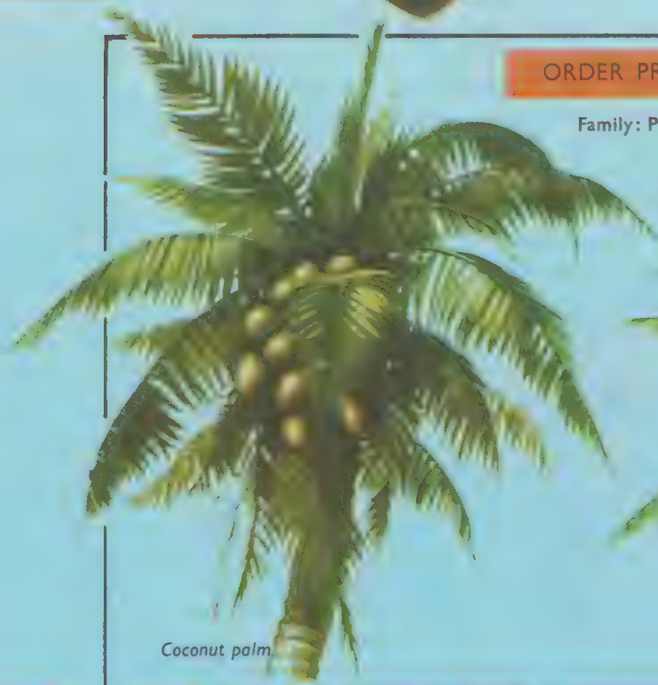
Paphiopedilum insigne

Two of the numerous cultivated species of orchid

Sugar cane

ORDER PRINCIPES

Family: Palmaceae



Coconut palm

Date palm

ORDER SPATHIFLORAE

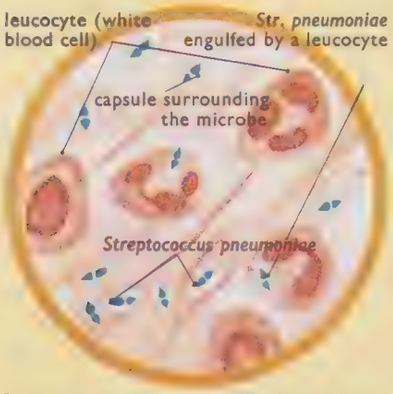
Family:
Araceae
Example:
lords-and-ladies

The strange 'flower' of lords-and-ladies or arum is really an inflorescence, the spadix, enclosed in a bract, the spathe

Papyrus plants

P N E U M O N I A

PNEUMONIA means inflammation of the lungs. It is an unpleasant disease which, until a quarter of a century ago, caused many thousands of deaths each year. Happily the sulphonamide drugs and the antibiotics (see page 612) have much reduced the menace of this illness, though it is still a threat to the very young and very old.


leucocyte (white blood cell)
Str. pneumoniae engulfed by a leucocyte
capsule surrounding the microbe
Streptococcus pneumoniae

Streptococcus pneumoniae *in phlegm from a patient with pneumonia* (× 1250)

THREE KINDS OF PNEUMONIA

There are three quite different and easily recognisable types of pneumonia. The most alarming variety is called *lobar pneumonia*. In this illness a whole *lobe* of lung tissue (or at least a large part of a lobe) is affected at the same time. In *bronchopneumonia*, on the other hand, the disease is usually less extensive and affects chiefly the lung tissue close to the small air passages, the *bronchioles* and the lesser *bronchi* (see page 2369). The third type of pneumonia is quite unlike either lobar pneumonia or bronchopneumonia in both symptoms and course. For this reason it is called *atypical pneumonia*. Although there are important differences between the types of pneumonia, the symptoms in all three varieties are due to the inflammation of the lungs' air sacs, the *alveoli*. In all varieties there is a high temperature and a cough. Furthermore, since inflamed alveoli are unable to play their part in respiration, there is difficulty in breathing. Sometimes – particularly in lobar pneumonia – there is severe pain in the chest as the inflammation spreads to the lining of the lungs.

LOBAR PNEUMONIA

Lobar pneumonia was known to the physicians of Ancient Greece, and an excellent account of this illness was written as early as the 2nd century A D by the Alexandrian physician Aretaeus of Cappadocia. It is an infectious disease which is easily transmitted from a victim to susceptible people who come into contact with him. In the days when lobar pneumonia was a common illness it frequently occurred in small epidemics – a whole household, a school, or a prison community would be attacked at the same time.

The cause of lobar pneumonia was discovered by the German physician Fraenkel, who found the microbe now known as *Streptococcus pneumoniae* in the mouths and throats of many of his pneumonia patients. Later it was discovered that there are many different strains of the microbe, but that only a few of them are important causes of lobar pneumonia. *Streptococcus pneumoniae* may occasionally invade the lungs without causing any illness. People infected in this way are called *carriers*, for although they are well themselves, they are able to carry the germ to other people in whom it causes a typical pneumonic attack.

Before the invention of the sulphonamide group of drugs and the discovery of the antibiotics an attack of lobar pneumonia ran a characteristic course which has been described in great detail by many medical writers. It is fortunate that we have these records, for the new drugs are so effective in the treatment of lobar pneumonia that the natural course of the disease is very seldom seen today. Treatment with antibiotics in the early stages of the illness prevents the growth of the invading microbes, and the disease is arrested.

BRONCHOPNEUMONIA

The cause of bronchopneumonia is seldom the virulent microbe *Streptococcus pneumoniae*, but usually one or other of several different microbes which are commonly found in the respiratory passages of healthy people. Under normal circumstances these microbes are held in check by the body's natural defences, but when these defences are weakened the microbes multiply rapidly and may then cause disease.

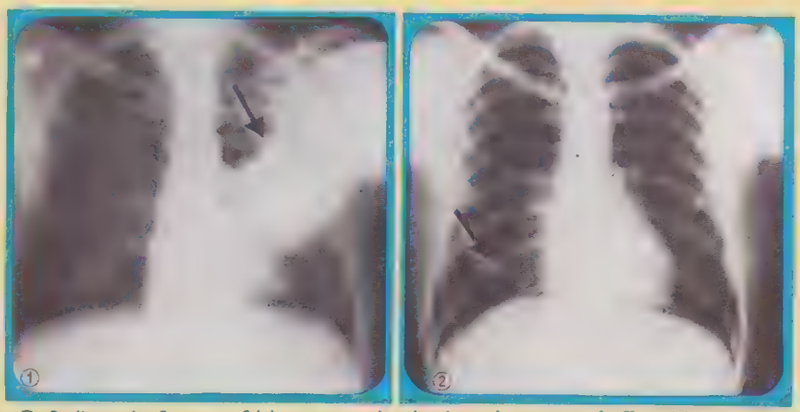
Weakening of the body's defences occurs in many illnesses, particularly in the very young and very old. It is for this reason that bronchopneumonia is a frequent complication of the childhood diseases measles and whooping cough (see page 2261). In adults it is often a complication of influenza, and it is likely to attack old people who are confined to bed with any illness or injury which prevents them from moving about properly. Bronchopneumonia may follow an attack of bronchitis at any age.

Bronchopneumonia together with another illness is a very serious condition, and it is not infrequently the cause of a patient's death. Unfortunately the antibiotics are, for a variety of reasons, less effective in this illness than in lobar pneumonia.

ATYPICAL PNEUMONIA

Atypical pneumonia is a far less serious illness than either lobar or bronchopneumonia. Even without treatment its victims almost always recover quite quickly. This is indeed fortunate, for until quite recently little was known about the cause of this illness, and no drugs were known which had any effect on its progress.

During the Second World War it was discovered that some cases of atypical pneumonia are caused by an organism called *Rickettsia burneti*. Then, a few years later, it was found that many others are the result of infection of the lungs with viruses. This *virus pneumonia* proved to be infectious, and it was common among soldiers.



① *Radiograph of a case of lobar pneumonia, showing a large area of affected lung*
② *Radiograph of a case of bronchopneumonia, showing small diseased area in right lung*

CANADA: cities

THE Dominion of Canada, with an area of 3,845,144 square miles, is the largest country in the British Commonwealth and the third largest country in the world – after Russia and China. But in this huge area (see page 358), which stretches from the Arctic Ocean in the north to the United States in the south and from the Atlantic Ocean in the east to the Pacific Ocean in the west, there are only 18,238,000 people – one-tenth of the population of the United States. And there are only five people for every square mile of Canadian territory, compared with 52 for every square mile in the United States.

Geographical position of Canada's main cities

But to imagine the relatively small Canadian population evenly distributed over this vast country would be misleading. Great stretches of Canada, particularly in the north, are almost completely uninhabited. This is mainly because of the inhospitable climate in the northern regions where, despite rich mineral resources, none but the hardy few are attracted to make their homes. The vast majority of Canadians – about 90 per cent – live within 300 miles of the United States border, mainly in the fertile valley of the St Lawrence, Canada's greatest river, and in the rich prairie provinces farther west. It is here, in this narrow belt, that most of Canada's largest cities have grown up, mainly in the last 150 years. And whereas in 1900 about one in three Canadians lived in a town, today 62 per cent of the population are town and city dwellers.

Ottawa, the capital

Why is Ottawa the capital of Canada? It is not the country's largest city; it is of relatively recent origin; and it has never been an important centre of industry and commerce. The reason is simply that in 1858 Queen Victoria decided that it should be the capital rather than one of the rival claimants – Montreal, Quebec, Toronto, and Kingston. Since 1867 Ottawa has been the seat of the Federal government (see page 228) and contains most of the government and public buildings – the governor-general's residence, the parliament buildings, and the national museums and art gallery. Many of the 429,750 inhabitants are civil servants, and the city's atmosphere is essentially dignified.

Ottawa was founded on the right bank of the Ottawa river in 1826 by Colonel John By of the Royal Engineers who came there to build the Rideau Canal, a 123-mile defensive water link with Lake Ontario. Till 1854 the town was called Bytown, in memory of the Colonel, but in that year its name was changed to Ottawa (after an Indian tribe that lived farther up the river) and it was granted a city charter. Ottawa grew rapidly in the second half of the 19th century and is today Canada's fifth largest city.

The centre of Ottawa with the Rideau Canal which links the city with Lake Ontario

The 293-foot-high Peace Tower in front of the parliament buildings in Ottawa. The nation's capital is guarded by the world-famous Mounties – more properly called the Royal Canadian Mounted Police

Montreal, the world's greatest inland port and Canada's largest city, built on an island at one end of the St Lawrence Seaway

Montreal, the giant inland port

Montreal (2,156,000) is the largest city in Canada and the industrial capital of the country. It is also the second largest French-speaking city in the world – after Paris. Built on an island of volcanic origin (some 30 miles long by 10 miles wide) which lies at the junction of the St Lawrence and Ottawa rivers, Montreal has grown to be the largest inland port in the world. It handles most of Canada's shipping, except when the St Lawrence Seaway is closed by ice in winter (see page 369).

Montreal has had a colourful past: it was first an Iroquois Indian village named Hochelaga; later Place Royale, a fur-trading post; and later still Ville Marie, a French missionary settlement. In 1760, a year after the capture of Quebec (see page 228), it came into the hands of the British.

Today Montreal betrays its British-French heritage on every side. Street names such as Lagauchetière, Maisonneuve, and Notre Dame rub shoulders with Pine, Mountain, Stanley, McTavish, and McGill. All street signs, advertisements, and official publications are in both French and English, and Montreal is a thriving, cosmopolitan centre of industry, finance, and the arts. There are large communities of Slavs, Italians, Greeks, and Jews, as well as of British and French, and for the most part the different cultures manage to combine to form a vibrant, exciting city with a character peculiarly its own.

The Lachine Rapids on the St Lawrence provide abundant hydroelectric power for Montreal's numerous industries, which include timber, pulp and paper mills, furniture factories, flour mills, sugar refineries, and tobacco works.

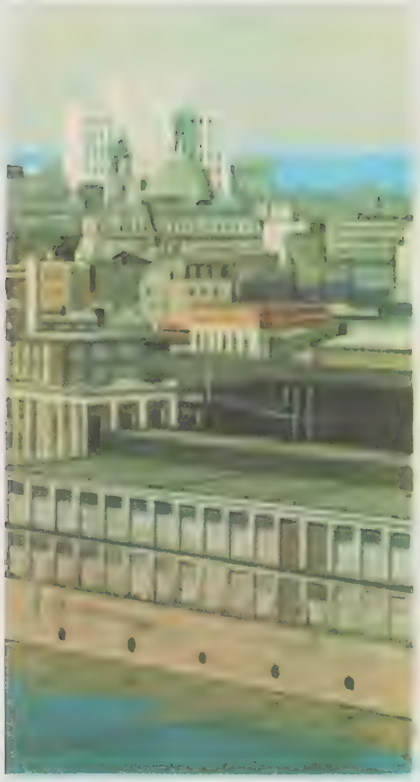
Toronto

Toronto, the capital of the province of Ontario, has a population of 1,869,000. It was first settled by Europeans in 1720 as a French trading post, and its name derives from an Indian word *tarantou*, meaning 'meeting place', which referred to the crossing there of fur traders' trails.

Today Toronto is the major financial and banking centre of Canada, and in manufacturing is second only to Montreal. Much educational, artistic, musical, and publishing activity takes place in this predominantly English-speaking city, whose traditional reputation for dullness is quite unjustified. Cheap electricity, derived from the Niagara Falls (see page 2196), provides a plentiful source of power for Toronto's industries, and its position on the northern shore of Lake Ontario has made it an important inland port.

Since the Second World War many immigrants have arrived in Toronto, but have tended to stick together in their national groups rather than merge into the life of the city.

◀ *Toronto, Canada's second city, seen by night*



The old walled city of Quebec

Quebec, an historic city

Quebec (357,568), the capital of the province of Quebec, is the oldest city in French-Canada and today it is still 98 per cent French-speaking. It was founded in 1608 on the site of an Indian village and its name is probably derived from an Indian word *kebec*, meaning 'the narrows'. The promontory on which Quebec stands at the head of the St Lawrence estuary was an outstanding defence point, and it was here that the famous battle between the British and the French took place in 1759 which resulted in Quebec becoming an English colony.

With its old city walls, narrow cobbled streets, and 18th-century French architecture Quebec remains the most picturesque city in Canada and one of the country's main tourist attractions.

HAMILTON, THE 'BIRMINGHAM' OF CANADA

Close to Toronto – about 37 miles to the south-west on the shores of Lake Ontario – lies Hamilton (395,189), an important manufacturing centre with over 600 diversified industries. It has the largest open-air market in Canada and the largest shopping centre in the country. Hamilton was a pioneer in the use of hydro-electricity brought over a long-distance transmission-line, and this formed the basis of its rapid industrial expansion. Today its main industrial products include electrical appliances, agricultural machinery, and textiles. It is also the chief marketing centre and shipping point for the important fruit-growing region of the Niagara peninsula.

WINNIPEG, THE CENTRAL CITY

Winnipeg (475,989), the capital of the province of Manitoba, lies 62 miles north of the United States border, midway between the Atlantic and Pacific Oceans. It grew up at the junction of the Assiniboine and Red rivers which were both vital 'highways' in fur-trading days, and its name comes from the Indian phrase *win-nipiy*, meaning 'murky water'. Winnipeg is the main grain market and financial and distributing centre for the whole of the prairies. The corner of Portage and Main Streets in the centre of Winnipeg is supposed to be the centre of Canada.

Vancouver

So far we have only described cities in the eastern part of Canada. But the country's third largest city, Vancouver, is on the Pacific coast of British Columbia. The site of the city was covered by forest until 1885 when the Canadian Pacific Railway reached it. Since then it has grown rapidly and now has a population of 790,165. Vancouver is separated from the rest of Canada by the great Rocky Mountains and is unique in character. Because of its mild climate (temperatures in the 70s in summer, and in winter seldom below freezing) it is essentially an outdoor city. Vancouver has one of the finest natural harbours in the world, which, apart from its beauty, is of great importance for exporting Canada's wheat, especially during the winter months when the Great Lakes ports are closed by ice.

The beautiful city of Vancouver, on the Pacific coast of Canada

EDMONTON, GATEWAY TO THE NORTH

In 1794 George Sutherland completed a Hudson's Bay Company fort which he called Edmonton, after the Edmonton river near London. Although this fort was destroyed by Blood Indians in 1807, the name was retained for a larger one, built 12 years later, which became a centre for northern traders and missionaries.

Edmonton was mainly important as a fur-trading post until the Canadian National Railway reached it in 1891. Then it started to expand rapidly, and in 1898 became the starting-off point and supply base for the Klondike gold rush. Today Edmonton (337,568) is the capital of the province of Alberta and one of the richest cities in Canada because of the large deposits of coal, oil, and natural gas which occur in the vicinity.

CALGARY, THE OIL CITY

In the late 19th century the Canadian west was wild and lawless, and the government at Ottawa formed the famous North-West Mounted Police, or 'Mounties', specially to control the buffalo hunters, trappers, and whisky traders there. In 1875 a detachment of Mounties under Colonel J. F. Macleod set up camp at the confluence of the Bow and Elbow rivers. They called the place Calgary, after a Gaelic word meaning 'clear running water'.

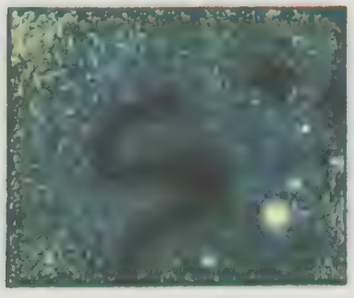
Calgary has grown enormously in its short life and now has a population of 279,062. It is the chief wheat and livestock market for the southern part of the province of Alberta and is famous for its annual 'stampede' or rodeo. The discovery of oil nearby has brought great prosperity to this western city.

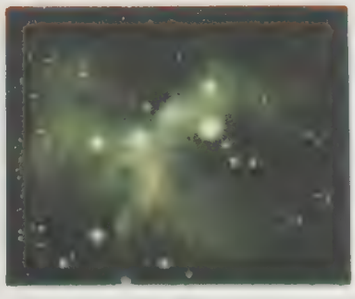
CELESTIAL BODIES (part two)

The vast, glowing Orion Nebula

The Horse's Head Nebula in the constellation of Orion – a cold cloud of gas and opaque dust squeezed by hot surrounding gas

Left to right: the Owl Nebula, a shell of gas expelled by a star; the Elephant's Trunk of cool, opaque gas; a hot gas cloud, NGC 661





THE vast distances between stars are not completely empty of all matter. It is true that interstellar space is almost a perfect vacuum, but it still contains enough gas and dust to allow new stars to be made. The amount of these substances in space is usually so little that it cannot be detected; but occasionally the gas and dust condense into large clouds which can be seen even with a low-power telescope. These dense clouds are called *galactic nebulae*.

The two main types of galactic nebulae, formed in different ways, are the *diffuse nebulae* and the *planetary nebulae*.

The diffuse nebulae may be dark or bright. The dark ones appear as black holes, streaks, or lanes in a field of stars. These nebulae absorb the starlight and prevent it passing through to the Earth, so the stars behind them cannot be seen. They are wide, spreading, and irregular, with no definite boundaries. They can be enormous. The Horse's Head Nebula in Orion, for example, is about 10 million million miles across.

When one of these clouds is near a bright star the heat and light from the star will illuminate the gas cloud and make it shine, like street lamps in a fog. Such nebulae are called bright diffuse nebulae. Some of the light from the nebula is reflected starlight and some comes from the luminous gas.

The planetary nebulae have no connection at all with the planets. They get their name because, like planets, they have a well-defined shape when seen through a telescope. These nebulae are usually elliptical in shape, with a very hot, blue star at the centre. The gas forms a shell around the star and was possibly thrown off by it in a gigantic explosion.

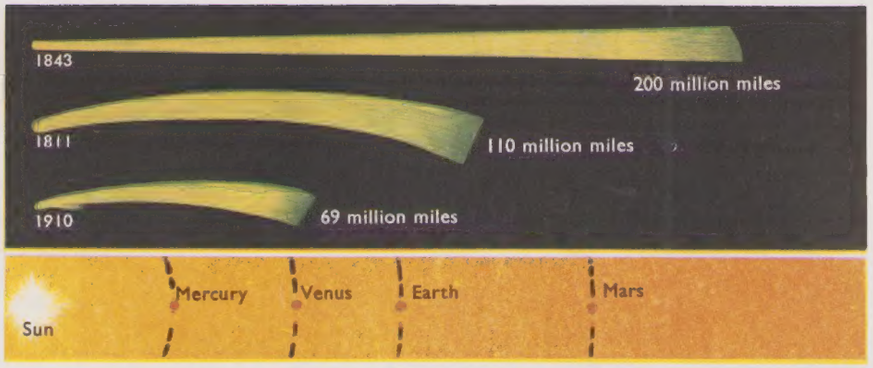
The bright diffuse nebulae are the possible birthplaces of a star, whereas the planetary nebulae mark the death of a star.

Comets

Comets are the strangest members of our Solar System. Their name comes from the Latin *stellae comatae*, hairy stars – an apt description. On average one comet is visible to the naked eye each year, but most comets are far away and very faint. When a large comet comes close to the Earth it is a very spectacular object. We can then see that it is made up of three parts: the nucleus, the coma, and the tail.

The first part of the comet to be seen as it approaches the Sun is its nucleus. This is a glowing ball of meteoric material – stones, dust, and gas. When the comet is nearer the Sun a hazy shell of light called the coma develops around the

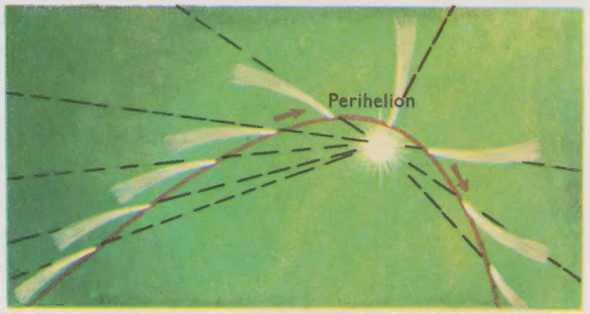
Halley's Comet as it appeared on 6th May 1910. It has a glowing 'head' and a long 'tail'



The length of some recent comets compared with the size of the planetary orbits

nucleus. When quite close to the Sun a tail forms, stretching out from the head (the nucleus and coma). The tail always points away from the Sun because of the pressure of the solar radiation and the continuous flow of particles streaming from the Sun.

The head of the comet may be 10,000 to 100,000 miles wide, and the tail may be millions of miles long; but despite its enormous size the *mass* of a comet is very small. When a comet passes close to a planet the orbit of the comet is considerably changed but that of the planet is not affected. This means that the comet's mass is less than one-hundred-thousandth of the mass of the Earth. The average density of a comet is about $\frac{1}{2}$ ounce per cubic mile. (1 cubic mile of sea water weighs about 4,000 million tons.) In 1910 the Earth passed through the tail of Halley's Comet and it could hardly be detected.



Most comets travel in very elongated orbits around the Sun. The head of the comet faces the Sun, and the tail streams out away from it

Most comets move around the Sun in elliptical orbits, and once their orbit has been plotted we can predict when they will return and when they have appeared before. Halley's Comet, one of the best-known of all, has been traced back to 240 B C, and every appearance except one has been recorded. It is possible, too, that this is the comet recorded by both the Chinese and Aristotle in 467 B C. It was also seen in 1066, and is even shown in the Bayeux Tapestry depicting the Norman Conquest (see page 474). It was last seen in 1910 and will reappear in 1986.

The crater made by the impact of a meteorite in Winslow, Arizona (USA)

METEORS AND METEORITES

Meteors and meteorites are cosmic debris – that is, pieces of rock and metal dashing around in outer space which are captured by the Earth's gravitational pull. The smallest ones – the meteors or shooting stars – are merely grains of dust and small stones. As they hurtle through the atmosphere at speeds between 8 and 45 miles per second they burn up. For a little while they glow brightly as they burn and then they fall to the Earth's surface as a fine dust.

Meteorites are much bigger and they hit the Earth as solid lumps. Some are made mainly of iron and nickel, others mainly of silicates, and others are mixtures. Meteorites can be extremely large. One of the heaviest known, which fell at Hoba West in South Africa, weighed 60 tons. A direct hit from such a meteorite could destroy a city. The area flattened by the meteorite itself would be quite small; most of the destruction would be caused by the shock wave and earthquake that would follow the impact. Fortunately meteorites of this size are very rare.

The origin of meteors and meteorites is uncertain, but they are probably the remains of comets which have long since broken up.

PLANETS AND SATELLITES

Planets revolve in nearly circular orbits around the Sun (see page 24), and the satellites revolve around the planets.

Probably planets and satellites were formed at the same time as the Sun. If this is so, other stars will also have families of planets surrounding them, but these would be far too small to be seen even with the largest telescope.

CHARLES XII OF SWEDEN

Charles XII (1682–1718), *Sweden's great warrior-king*

MANY boys dream of emulating history's great conquerors at an early age. Charles XII of Sweden carried such dreams to reality, for by the time he was 18 he was the most celebrated military leader of his day and he had made the Swedish army among the most feared and respected in Europe.

It is easy to forget that Sweden was once one of Europe's mightiest powers. Yet at the end of the 17th century it seemed probable that Sweden, already possessor of an empire which included Finland, Estonia, Livonia, and Danish and German territory, might conquer all of northern Europe and safeguard herself by conquering Russia and Poland as well.

Charles XII came to the throne in 1697, following a generation of wars in which Sweden had fought against Russia, Poland, and Denmark. He had not been long on the throne when these countries, inspired by Augustus, Elector of Saxony and King of Poland, formed a coalition against him. Fighting had broken out by 1700.

The Great Northern War

Facing a prospect sufficient to daunt the most mature and seasoned of campaigners, the boy-king of Sweden proved more than a match for his array of opponents. A breathtaking sea-crossing up the eastern end of the Sound to Denmark enabled him to win a crushing victory north of Copenhagen on 4th August 1700, and a fortnight later peace with Denmark was triumphantly concluded. Charles now turned towards Livonia, but hearing that Narva faced imminent danger from the Russians he decided to march straight to its relief. All his generals opposed the decision, but after a thrilling rout of 6,000 Russians by 400 Swedish cavalry Charles came near enough to signal his approach to the beleaguered garrison in Narva on 19th November. The following morning the Swedes advanced in battle array. The battle of Narva, fought in a blinding snowstorm, was a complete Swedish victory. The Russians were annihilated, and Peter the Great (see page 2172) fled from the battlefield, crying like a child.

In a few glittering months Charles had dazzled all Europe with his military genius and the prowess of his armies. What new heights were there for him to scale? His advisers urged him to march straight on Moscow and destroy for ever the menace of Russia. But Charles was determined to punish Poland for her treachery, and in the summer of 1701 he cleared the Poles out of Livonia and occupied Courland. Early the following year he proclaimed the deposition of Augustus, and after taking Warsaw on 14th May routed a combined army of Poles and Saxons at Klissow. More victories followed, and the Poles were forced to elect Charles's candidate, Stanislaus Leszczynski, to the Polish throne. Stanislaus was crowned in September 1705, and two years later Augustus abdicated. At last there was nothing to prevent Charles from turning his now legendary armies against the Tsar of Russia.

In November 1707 Charles took the field at the head of a huge army, and on New Year's Day 1708 he crossed the frozen Vistula. On 4th July he cut the Russian line in two by a victory at Holowczyn and so opened the way to the Dnieper.

The exploits of Napoleon and Hitler have made us familiar with the thought of an army plodding across the seemingly endless Russian wastes and ever diminishing from the ravages of cold, hunger, and disease. Charles's invasion of Russia set this terrible pattern. All through the summer heat and autumn rains his little host struggled on, soon to learn the horrors of the Russian winter. The winter of 1708–1709 was the most severe for 100 years and one of the worst in history. Charles himself remained almost unbelievably cheerful, but by mid-December it was obvious that the frozen, dispirited Swedes were incapable of reaching Moscow. Charles refused to retreat, but an attempt to join forces with the leader of the Dnieperian Cossacks, Ivan Mazepa, was foiled when Peter the Great defeated Mazepa before the two armies could join up.

When the winter was over Charles decided to take the fortress of Poltava and await reinforcements. On 27th June the Swedes, their morale restored, once more rallied to their king and swept joyfully into battle. At first the Russians fell back, but gradually they got the upper hand. The Swedes found themselves trapped in a great circle of troops armed with guns that fired five times to the Swedes' once. The Swedish infantry was annihilated, and the demoralised cavalry surrendered. Charles escaped with a mere 1,500 horsemen into Turkey.

Last years

Now began perhaps the strangest period in Charles's life. Despite urgent appeals from Sweden, he refused to leave Turkey. Instead he induced the Turks to declare war on Russia three times between 1710 and 1712, though without marked success. By 1713 the Turks had tired of him and made him a prisoner, but in the autumn of 1714 he escaped. With a single attendant he made his way across Europe and arrived unexpectedly in Stralsund, a Swedish port on the Baltic coast of Germany, at midnight on 11th November.

The Great Northern War, which had begun so brilliantly for Sweden, was now draining away the nation's life blood. Her German, Danish, Polish, and Russian enemies were making vast inroads on her territory. Yet Charles would make no compromise peace. He defended Stralsund till it was reduced to a heap of rubble, and in 1717 and 1718 he launched attacks on Norway. On 11th December 1718 the Swedish troops were besieging the Norwegian fortress of Fredriksten. Charles, who was in the foremost trench, looked over the parapet and was killed instantly by a bullet through the head.

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Three grades

The clerical work in an office is usually divided up between the junior clerks, the shorthand-typists, and the private secretaries. Each is important in her own way and contributes to the smooth running of the office. Of these, the private secretary is expected to take the most responsibility and therefore should have the highest qualifications. Both junior clerks and shorthand-typists are encouraged to take courses to continue their education and so progress to more responsible positions, and may be given time off to do so.

What is a private secretary?

A private secretary is the 'right-hand girl' of a business man or woman. She not only does as she is told but also does a great many tasks behind the scenes to save her employer valuable time. She learns as much as she can about the organisation of which she is now a part, and keeps herself well-informed by carefully reading newspapers and periodicals. She is loyal to her employer, discreet about his affairs, and tactful and pleasant on the telephone and to visitors. Her appearance can be as important as her manner and ability, and she should always be neatly dressed.

A secretary at work, taking down a letter in shorthand

What does a secretary do?

Much of the work done by the secretary will vary according to the sort of person she is working for, whether a doctor, publisher, sales manager, travel agent, accountant, or insurance agent. Some deal with more letters than others, and send out regular reports, while some spend hours on the telephone or deal directly with other people.

A certain amount of routine work is done in most offices. When the secretary arrives, punctually, each morning, her first task is usually to sort and open the post; she is also responsible for seeing that the letters to be posted are properly stamped and addressed and contain everything that they should. She should always keep her employer's diary up-to-date, reminding him of any changes that have been made in the day's appointments and having ready any papers or reference books that might be needed at meetings. Keeping the office supplied with stationery is often the secretary's responsibility, and she should also see that her typewriter and other office equipment are always in good running order. A great many people nowadays have to travel to other towns or even other countries to carry on their business. Their secretaries may or may not go with them, but in either case it is the secretary who has to make the travel arrangements – get the tickets, book hotel rooms, order a taxi or hire a car if necessary – and check carefully on the times of arrival and departure.

To do all these things a secretary has to know, or be able to find out, what postal services are available, how to use the telephone or telex system, and how to use a railway timetable. She must also remember to keep a careful note of all the arrangements she has made, and keep her employer informed.

Unlimited opportunities

There are secretaries at work everywhere – in government offices, in the Forces, in commercial or charitable organisations, and so on. The opportunities for a well-trained secretary are unlimited, and the work immensely varied; not all secretaries are confined to their offices, for some are expected to travel from place to place with their employers. Those who like frequent changes can join an agency as a 'temporary', going wherever there is a vacancy for a few weeks, days, or even hours.

Perhaps the most exciting thing about secretarial work is that it can provide a chance to develop a natural aptitude for something else, such as advertising, journalism, social work, or management.

AN EXCITING CAREER

Today practically all professions are open to women, and young girls are encouraged to think about a career while they are still at school. This gives them a chance to develop their natural talents and work for the qualifications they will need. Secretarial work is chosen by some because they are undecided or do not have a vocation for nursing, teaching, social work, or any other profession. University graduates often take a secretarial course because they are told it will be useful. But a secretarial training can be more than just useful – it can open the door to an exciting and worthwhile career.

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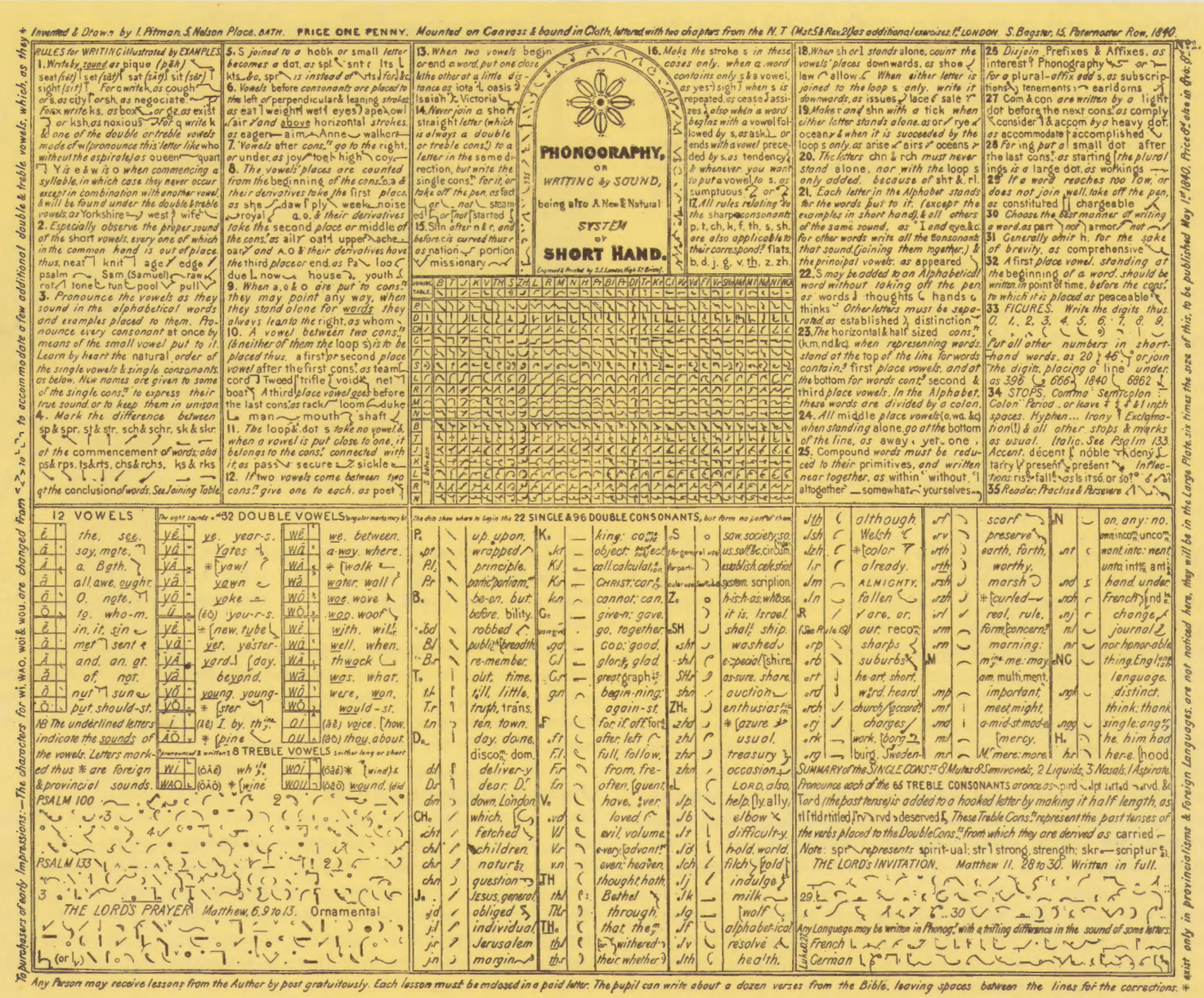
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PITMAN'S PENNY PLATE

On 10th January 1840 penny postage was introduced in the United Kingdom. On the same day Sir Isaac Pitman published his Penny Plate (above), outlining the principles of his 'phonography or writing by sound'. He sent out hundreds of copies of this pamphlet, which invited its readers to write to the author for lessons in the use of Pitman's shorthand, devised and first published three years earlier, in 1837. Pitman's system, modified and expanded as business language has changed, is now the most widely used system of shorthand in the world.

Since Roman times (see part one) all systems of shorthand have proved valuable whenever a fast and accurate record of the spoken word has been needed; today shorthand is used in the business world by secretaries, in the world of journalism by reporters, at universities by both students and lecturers, and by professional shorthand reporters in the court- or conference-room.

The great advantages of shorthand over dictating machines or tape-recorders are its adaptability, speed, and simplicity. In the office it can be used equally well for recording meetings, lengthy reports, short instructions, or messages over the telephone, and the only equipment needed is an alert mind, a pen, and a writing pad.